

$$(x-3)^2 \quad r+3$$

$$\sqrt{x-3} \quad r+3$$

$$|x-3| \quad r+3$$

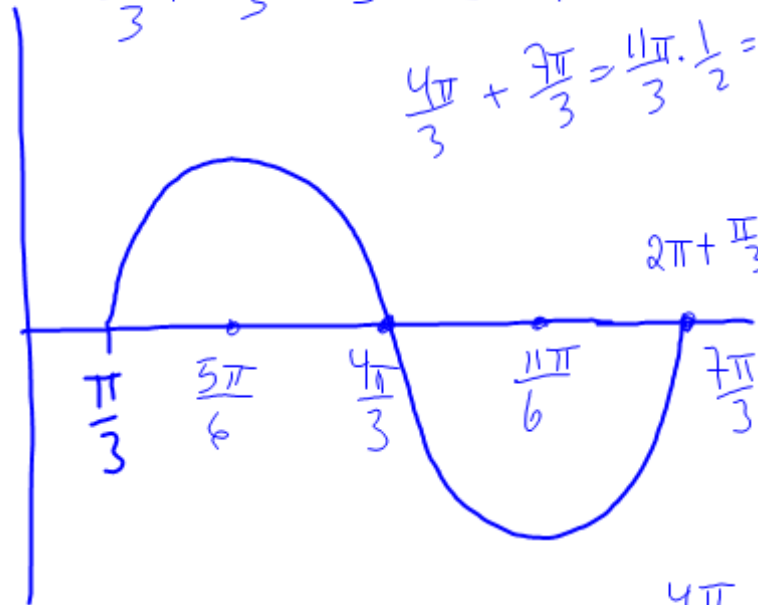
$$\sqrt{1-(x-3)^2} \quad r+3$$

$$\sin(x-3) \quad r+3$$

$$\sin\left(x - \frac{\pi}{3}\right)$$

$$\frac{\pi}{3} + \frac{4\pi}{3} = \frac{5\pi}{3} \cdot \frac{1}{2} = \frac{5\pi}{6}$$

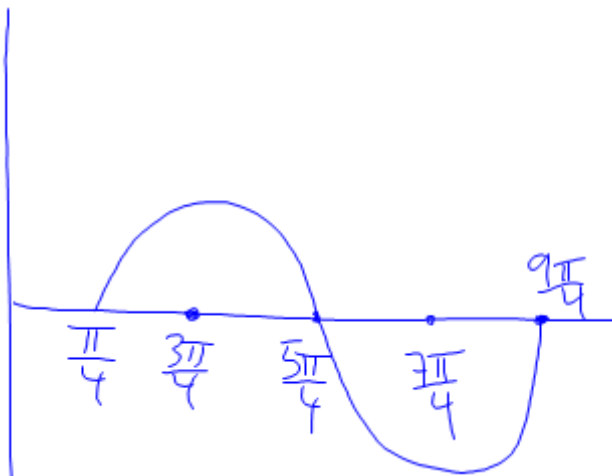
$$\frac{4\pi}{3} + \frac{7\pi}{3} = \frac{11\pi}{3} \cdot \frac{1}{2} = \frac{11\pi}{6}$$



$$\frac{\pi}{3} + \frac{7\pi}{3} = \frac{8\pi}{3} \cdot \frac{1}{2} = \frac{4\pi}{3}$$

$$\sin\left(x - \frac{\pi}{4}\right)$$

$$1 + \frac{\pi}{4}$$



$$\frac{\pi}{4} + \frac{5\pi}{4} = \frac{6\pi}{4} \cdot \frac{1}{2} = \frac{3\pi}{4}$$

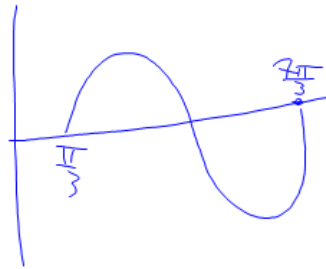
$$\frac{4}{4} \cdot \frac{2\pi}{1} + \frac{\pi}{4} = \frac{8\pi}{4} + \frac{\pi}{4} = \frac{9\pi}{4}$$

$$\frac{\pi}{4} + \frac{9\pi}{4} = \frac{10\pi}{4} \cdot \frac{1}{2} = \frac{5\pi}{4}$$

$$(2) \sin(x - \frac{\pi}{3})$$

$$0 \leq x - \frac{\pi}{3} \leq 2\pi$$

$$\frac{\pi}{3} \leq x \leq \frac{7\pi}{3}$$



$$\sin(2x - \frac{\pi}{8})$$

$$0 \leq 2x - \frac{\pi}{8} \leq 2\pi$$

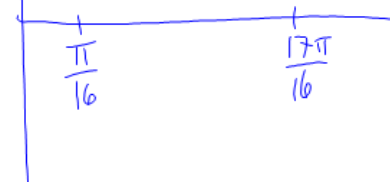
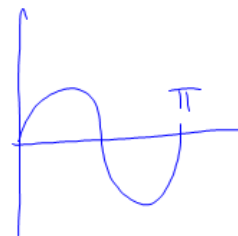
$$\frac{1}{2} \cdot \frac{\pi}{8} \leq \frac{2x}{2} \leq \frac{17\pi}{8} \cdot \frac{1}{2}$$

$$\frac{\pi}{16} \leq x \leq \frac{17\pi}{16}$$

$$\sin(2x - \frac{\pi}{8})$$

$$\sin 2(x - \frac{\pi}{16})$$

$$p = \frac{2\pi}{2} = \pi$$



$$y = \pm a \sin[b(x-c)] + d$$

$$y = \pm a \cos[b(x-c)] + d$$

Annotations for the cosine equation:

- flip over x-axis (when neg.) → points to the \pm sign
- Amplitude → points to a
- frequency → points to b
- horiz. Shift → points to c
- vert. Shift → points to d

graph

$$\sin\left(x - \frac{\pi}{5}\right) \quad \frac{\pi}{5}, \frac{7\pi}{10}, \frac{6\pi}{5}, \frac{17\pi}{10}, \frac{11\pi}{5}$$



$$\cos\left(x - \frac{\pi}{3}\right) \quad \frac{\pi}{3}, \frac{5\pi}{6}, \frac{4\pi}{3}, \frac{11\pi}{6}, \frac{7\pi}{3}$$



$$\sin\left(x + \frac{\pi}{4}\right) \quad -\frac{\pi}{4}, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

easier

$$\sin\left(3x - \pi\right) \quad \frac{\pi}{3}, \frac{\pi}{2}, \frac{2\pi}{3}, \frac{5\pi}{6}, \pi$$

$$3\left(x - \frac{\pi}{3}\right)$$

$$\cos\left(4x + 2\pi\right) \quad -\frac{\pi}{2}, -\frac{3\pi}{8}, -\frac{\pi}{4}, -\frac{\pi}{8}, 0$$

$$4\left(x + \frac{\pi}{2}\right)$$

$$\sin\left(4x - \pi\right) \quad \frac{\pi}{4}, \frac{3\pi}{8}, \frac{\pi}{2}, \frac{5\pi}{8}, \frac{3\pi}{4}$$

$$4\left(x - \frac{\pi}{4}\right)$$

harder

Sect. 4.2

15-21 (odd) - No graphs

23-33 (odd) - graph 1 period

} check in back